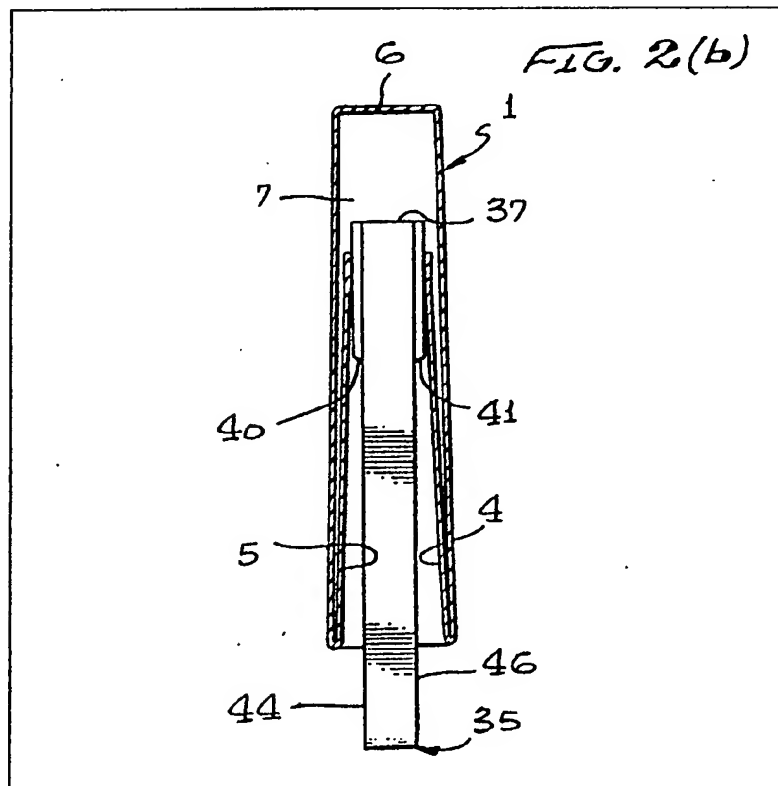


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(54) Self-locking tape cassette box

(57) A tape cassette box 1 formed from a single sheet of cardboard is open at one side for insertion of a tape cassette 35. Panels 4 and 5 formed by folding in extensions of the edges of the open side are engageable with steps 40 and 41 in the outer surfaces of tape cassette 35 and thus serve to lock the tape cassette in the box 1. The tape cassette can be released by squeezing together the two side panels of the tape cassette box at opposite ends of the open side. This removes the locking panels 4 and 5 from abutting engagement with the steps 40 and 41 on the tape cassette.



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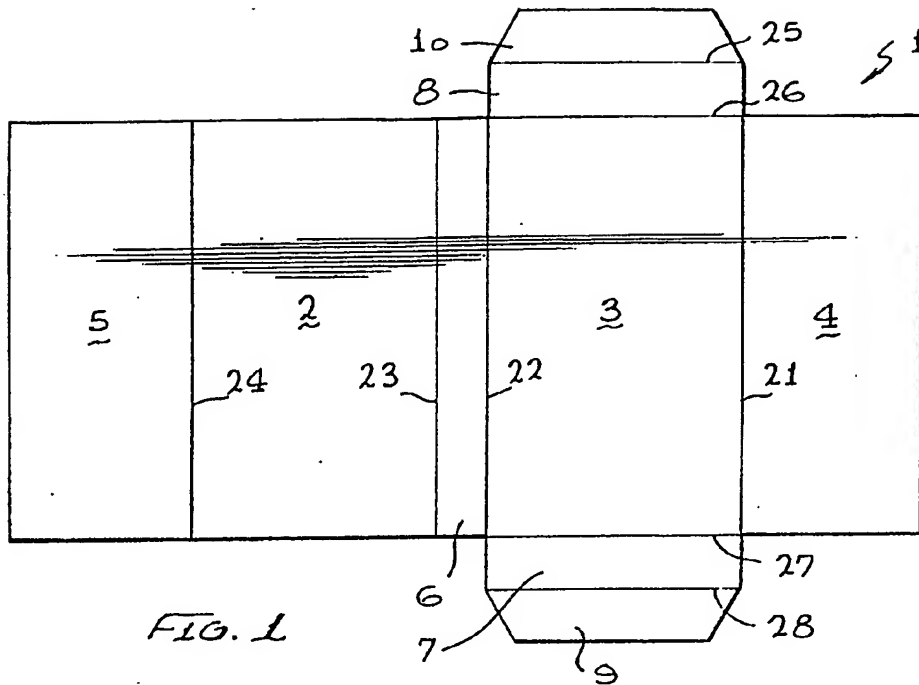


FIG. 1

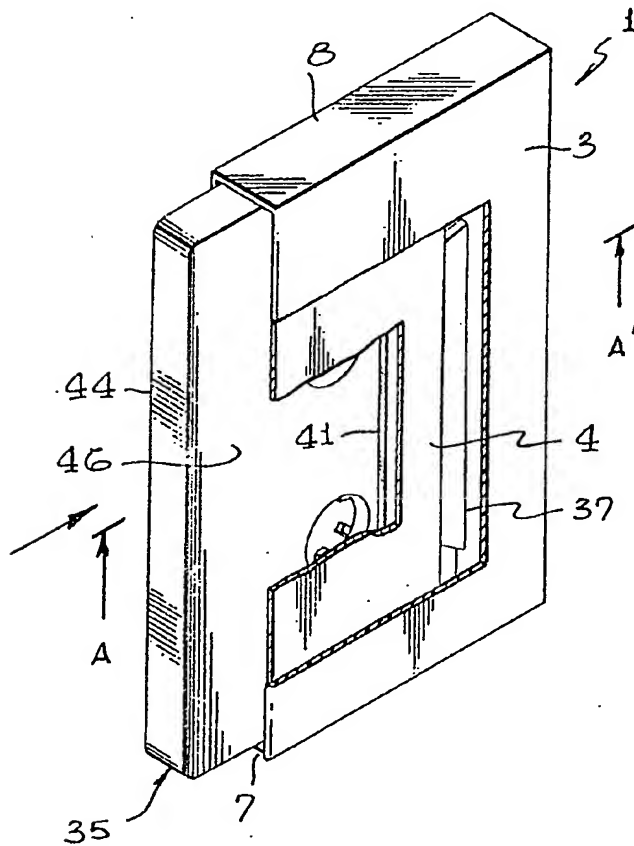


FIG. 2(a)

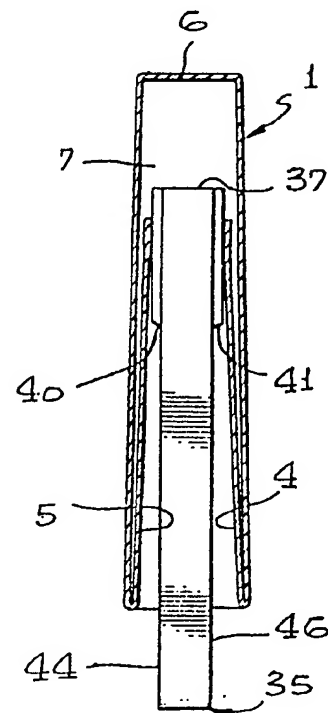


FIG. 2(b)

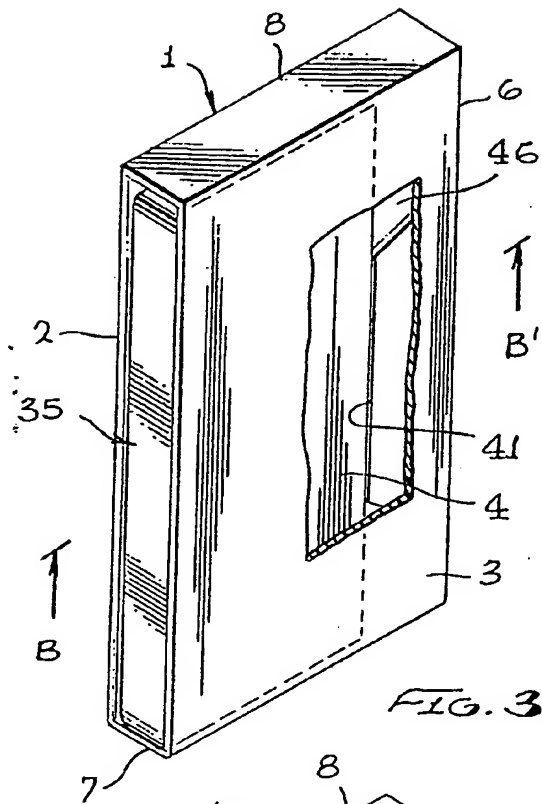


FIG. 3(a)

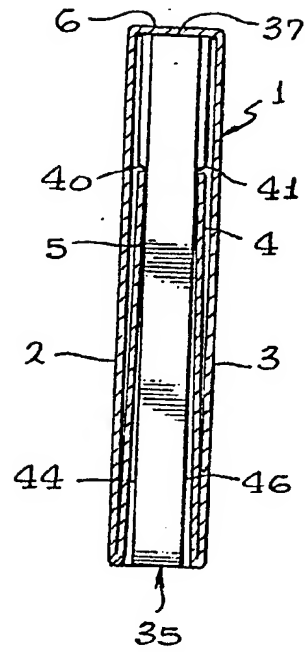


FIG. 3(b)

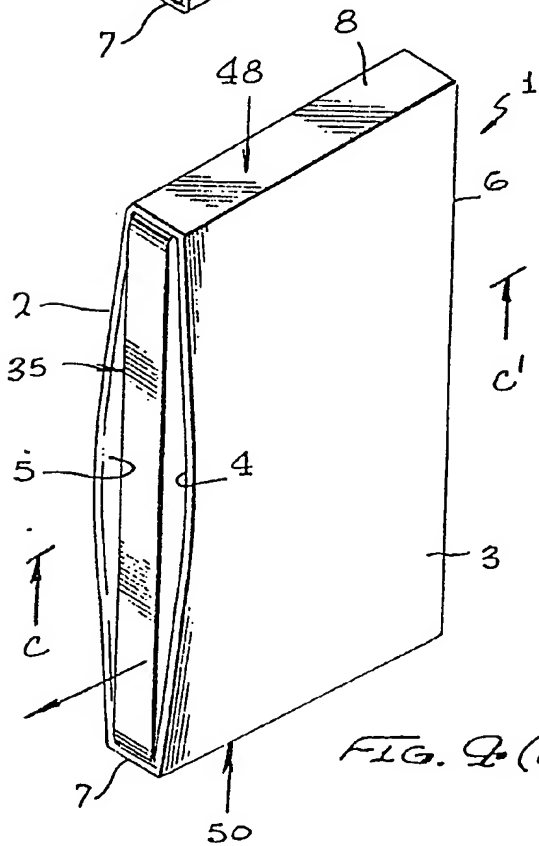


FIG. 4(a)

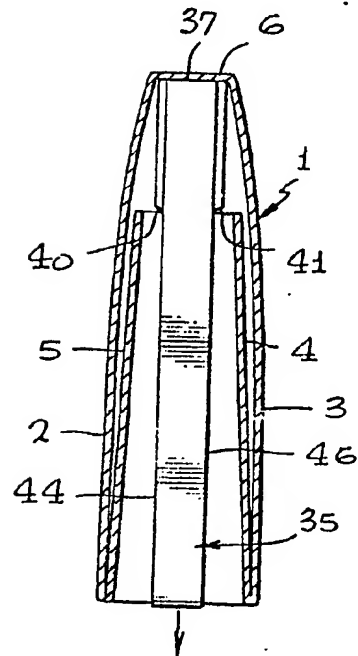
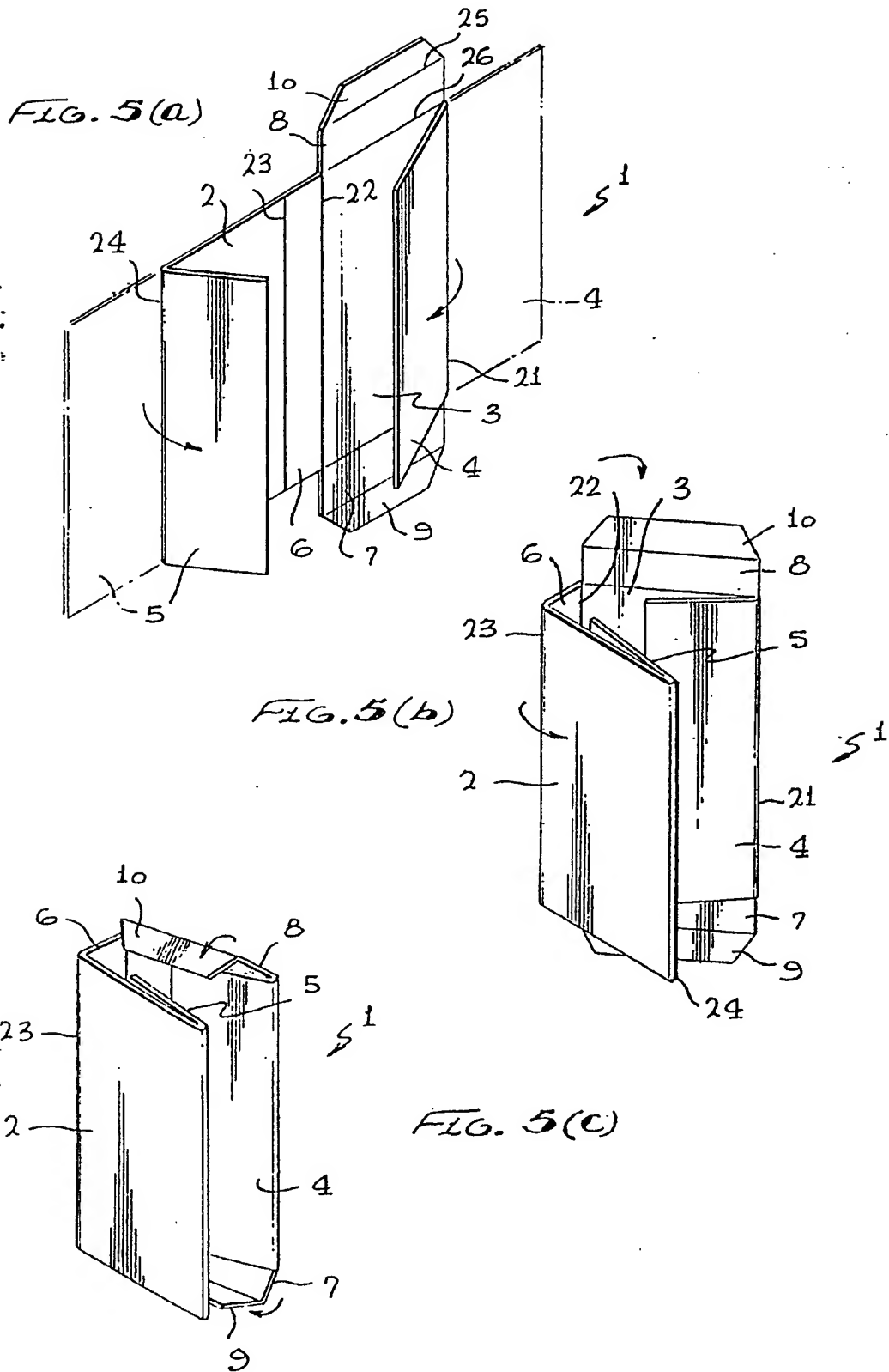


FIG. 4(b)



SPECIFICATION

Self-locking tape cassette box

5 The present invention relates to boxes for containing tape cassettes and in particular to a self-locking tape cassette box.

Boxes for tape cassettes are known. In order to securely retain the tape cassette in its box, however, it has been necessary in the past to provide specific additional structure for this purpose. This requirement has resulted in prior art tape cassette boxes which are both expensive to manufacture and cumbersome to use.

10 U.S. Patent No. 3,912,077, for example, discloses a cassette holder having a locking cover which is actuated by squeezing the tape cassette box. The need to have a cover to lock the tape cassette in, however, significantly adds to the complexity of the structure. Squeezing is also used to remove a locking cover in U.S. Patent No. 3,532,211, but the same need for complex structure is present.

The concept of locking a tape cassette in a tape cassette box by engaging a discontinuity on the tape cassette appears to be used in U.S. Patents 3,664,492; 3,994,551; 3,995,921; 3,909,088; 3,754,639 and 3,272,325. In each of these cassette boxes, however, substantial additional structure is required to perform the locking function. Moreover, significant dexterity is required to release the locking mechanism.

According to the present invention there is provided a tape cassette box for releasably retaining therein a tape cassette having a discontinuity or step thereon, the box including locking means for abuttingly engaging the discontinuity or step on the tape cassette when the tape cassette is fully inserted in the tape cassette box, and releasing means for disengaging the locking means from the discontinuity or step on the tape cassette to allow the cassette to be removed from the box, the releasing means being operable by squeezing together portions of the tape cassette box.

At least in its preferred form the present invention provides a tape cassette box which does not suffer from the above-mentioned and other problems of the prior art, which will release a tape cassette from locking engagement therein when its sides are squeezed together, which is inexpensive to manufacture, easy to assemble, and easy to use, which is light in weight and has a simple structure, and which can easily accommodate printed material thereon.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figure 1 shows a blank which can be folded along the lines indicated to form a box in accordance with the present invention;

Figure 2(a) shows a tape cassette partially inserted in a box partially cut-away, in accordance with the present invention;

Figure 2(b) shows a cross-section taken along the line A-A' of Figure 2(a);

Figure 3(a) shows a tape cassette fully inserted in the box of Figure 2(a) and 2(b);

Figure 3(b) shows a cross-section taken along the line B-B' of Figure 3;

Figure 4(a) shows the box being squeezed to permit removal of the tape cassette contained therein;

Figure 4(b) shows a cross-section taken along the line C-C' of Figure 4(a); and

Figures 5(a) to 5(c) illustrate the steps of folding the blank shown in Figure 1 into the box of Figures 3 to 4.

Figure 1 shows the general shape of a blank used to construct a tape cassette box in accordance with the present invention. The lines 21 to 28, are the lines along which this blank is folded to form the box. When so folded, as discussed below in detail, the following surfaces become identifiable: face panels 2 and 3; locking panels 4 and 5; back panel 6; side panels 7 and 8; and side panel closure tabs 9 and 10.

To construct the tape cassette box 1 from this blank of material, the panels should be temporarily folded inwardly along lines 21 to 28 to crease the material. Then, the locking panel 4 is folded inwardly on top of the face panel 3 along the line 21 and the locking panel 5 is folded inwardly along the line 24 on top of the face panel 2 as shown in Figure 5(a). The back panel 6 is then created by folding the face panel 2 and the locking panel 5 90 degrees inwardly along the folding line 23 and by folding face panel 3 and locking panel 4 90 degrees inwardly along the folding line 22 as shown in Figure 5(b). The side panel closure tabs 9 and 10 are then inserted in the slotted spaces between the locking panel 5 and the face panel 2 as shown in Figure 5(c). Fastening means such as glue placed on the surfaces of the side panel closure tabs 9 and 10 that contact the face panel 2 should be used to ensure that the tape cassette box 1 remains in its folded state.

The dimensions of the material used to construct the tape cassette box 1 are governed by the dimensions of the standard tape cassette. Thus, the width of the face panels 2 and 3 should be approximately equal to the width of the tape cassette, and the width of the back panel 6 and the side panels 7 and 8 are approximately equal to the thickness of the thickest part of the tape cassette.

The width of the locking panels 4 and 5 is somewhat shorter than the width of the face panels 2 and 3. In particular, the width of these locking panels should be approximately equal to the distance between the back of a standard tape cassette and the point towards the front at which the thickness of the tape cassette begins to increase due to the hereinafter described discontinuity thereon. The reason for this measurement selection, as will be more fully described below, is to permit cassette box 1 to lock the tape cassette once inserted therein.

Finally, the length of the face panels 2 and 3, the locking panels 4 and 5, and the back panel 6 is approximately 1/8" more than the length of a standard tape cassette. The reason for selecting this length is to permit the tape cassette box 1 to release the locking mechanism from abutting engagement with the discontinuity on the tape cassette, as will be more fully described below.

The material used to construct tape cassette box 1

should be sufficiently strong to ensure that after being folded its shape is not easily distorted. At the same time it should be sufficiently pliable to permit folding and flexing. The thickness of this material should not exceed, although it should preferably approach, the thickness of the hereinafter-described discontinuity on the face of the tape cassette. Although it is believed that there are a variety of materials suitable for this purpose, a quality grade of cardboard has been found to be a particularly suitable choice.

The tape cassette box 1 is designed to releasably lock a standard tape cassette therein. For this purpose, it is essential that the tape cassette should have a discontinuity or step on its face. While it is contemplated that many points on the tape cassette, such as its wheel hubs for example, can be used as the required discontinuity with slight obvious modifications of the box (discussed below), it is preferred that the outwardly protruding planar surfaces 40 and 41 (see Figure 2) located on the faces of the tape cassette between its front and back panels and parallel thereto be used for this purpose.

Figures 2, 3 and 4 illustrate the operation of the preferred embodiment of the invention.

In Figure 2, the tape cassette 35 is shown partially inserted in the tape cassette box 1. As the tape cassette 35 is inserted into the box 1, the forward portion 37 of the tape cassette 35 pushes apart the locking panels 4 and 5.

As the insertion of the tape cassette 35 in the tape cassette box 1 continues, there comes a point, as illustrated in Figure 3, when the outwardly protruding surfaces 40 and 41 pass by the innermost edges 35 of the locking panels 4 and 5. At this point, the resilience of the panels of the box causes the locking panels 4 and 5 to move inwardly until they abut the faces 44 and 46 of the tape cassette 35. Once this happens, the tape cassette 35 cannot easily be removed from tape cassette box 1 because of the abutting engagement of the innermost edges of the locking panels 4 and 5 with the protruding surfaces 40 and 41, respectively.

To permit removal of the tape cassette 35 from the box 1, as shown in Figure 4, the centre portions 48 and 50 of the side panels 8 and 7 respectively are pressed inwardly toward one another. This causes outward bulging of the face panels 2 and 3 and of locking panels 5 and 4. As locking panels 4 and 5 bulge outwardly, their innermost edges are withdrawn respectively from contact with the protruding portions 40 and 41 of tape cassette 35. As a consequence, the tape cassette 35 may then be easily removed from tape cassette box 1.

Once removed and once pressure is released from the centre portions 48 and 50 of the side panels 8 and 7, respectively, the tape cassette box 1 will return to its original shape. Thus, tape cassette box 1 will then be ready to securely retain tape cassette 35 when it is again inserted.

It is contemplated that promotional material will be printed on the outer surface of tape cassette box 1. Because the tape cassette box 1 can be formed entirely from a single flat piece of material, such promotional material can very easily be printed

directly on the blank prior to folding.

It is also contemplated that the tape cassette box containing a tape cassette may be wrapped in clear material such as cellophane (Registered Trade Mark) during the marketing stages of the product's use. A strip of material can be inserted in the tape cassette hubs in a well known manner so as to prevent accidental rotation of the hubs during transit.

Although the locking panels in the preferred embodiment have been illustrated as having a length equivalent to the length of the face panels, this is not necessary. They can be substantially shorter so long as a portion of their inner edges abut with a portion of the protruding surfaces on the tape cassette when the tape cassette is inserted in the tape cassette box. Moreover it is possible to use just one locking panel, although two are preferred.

It is also not essential that the above-described protruding surfaces (40 and 41) be used as the surfaces which abut the locking panels. For example, by redesigning the locking panels in an obvious manner to have inwardly protruding tabs at the point where the tape cassette hubs reside when the tape cassette is fully inserted the tape cassette hubs can function as the discontinuity or step which is abuttingly engaged by the locking panels. In this instance, the same squeeze-operated release means will operate to disengage the locking panels from abutting engagement with the tape cassette hubs.

CLAIMS

1. A tape cassette box for releasably retaining therein a tape cassette having a discontinuity or step thereon, the box including locking means for abuttingly engaging the discontinuity or step on the tape cassette when the tape cassette is fully inserted in the tape cassette box, and releasing means for disengaging the locking means from the discontinuity or step on the tape cassette to allow the cassette to be removed from the box, the releasing means being operable by squeezing together portions of the tape cassette box.

2. A box according to Claim 1, formed from a single sheet of material.

3. A box according to Claim 3, wherein the material is of cardboard.

4. A box according to Claim 3, in which the box has printed material thereon.

5. A box according to Claim 1, 2, 3 or 4 wherein the discontinuity comprises a raised planar surface protruding from a face of the tape cassette and wherein the locking means comprises a planar panel.

6. A tape cassette box for releasably retaining therein a tape cassette having a raised planar surface protruding from a face of the tape cassette, the box comprising an open-ended rectangular box and a locking panel positioned within the box and attached at one edge to an unattached edge of the box.

7. A box according to Claim 6, further comprising a second locking panel positioned within the box and attached at one edge to a second unattached edge of the box parallel to the said unattached edge.

8. A box according to Claim 7, formed from a

single sheet of material.

9. A box according to Claim 8 wherein the material is cardboard.

10. A box according to Claim 8 or 9 in which the box has printed material thereon.

11. A tape cassette box for releasably retaining therein a tape cassette having a raised planar surface protruding from a face of the tape cassette, the box comprising an outer face panel having an outer edge; two outer side panels opposite of and parallel to each other and attached to the outer face panel; locking means for abuttingly engaging the raised planar surface on the tape cassette, the locking means including an elongate locking panel attached at one end thereof to the outer edge of the outer face panel; and releasing means for disengaging the abutting engagement of the locking means from the raised planar surface on the tape cassette, the releasing means being operable by squeezing the two outer side panels together.

12. A self-locking tape cassette box formed from a single sheet of material for releasably locking therein a tape cassette having a discontinuity thereon.

13. A box according to Claim 12 further comprising printed material thereon.

14. A tape cassette box comprising a flat rectangular box of flexible resilient material which is open along one of its longer narrower sides and has two panels projecting inwardly from the longer edges of the open side, the inner edges of the panels being free and being engageable with steps on the faces of a tape cassette to retain the cassette in the box.

15. A tape cassette box according to any of the previous claims in combination with a tape cassette.

16. A tape cassette box substantially as hereinbefore described with reference to the accompanying drawings.